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ABSTRACT

The current debate about quantitative and qualitative research methods focuses on whether there is a necessary connection between method-type and research paradigm that makes the different approaches incompatible. This paper argues that the connection is not so much logical as rhetorical. Quantitative methods express the assumptions of a positivist paradigm, which holds that behavior can be explained through objective facts. Design and instrumentation persuade by showing how bias and error are eliminated. Qualitative methods express the assumptions of a phenomenological paradigm, which presupposes that there are multiple realities that are socially defined. Rich description persuades by showing that the researcher was immersed in the setting and giving the reader enough detail to make sense of the situation. While rhetorically different, the results of the two methodologies can be complementary. An analysis of two studies into the relationship of leadership on the part of school principals to organizational outcome indicates that there is an aesthetic connection between method types and paradigms, and it suggests some salient differences distinguishing qualitative and quantitative studies. (Author/TJH)

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MEANING IN METHOD:

THE RHETORIC OF QUANTITATIVE AND QUALITATIVE RESEARCH

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ABSTRACT

The current debate about quantitative and qualitative methods focuses on whether there is a necessary connection between method-type and research paradigm that makes the different approaches incompatible. This paper argues that the connection is not so much logical as rhetorical. Quantitative methods express the assumptions of a positivist paradigm which holds that behavior can be explained through objective facts. Design and instrumentation persuade by showing how bias and error are eliminated. Qualitative methods express the assumptions of a phenomenological paradigm that there are multiple realities which socially defined. Rich description persuades by showing that the researcher was immersed in the setting and giving the reader enough detail to "make sense" of the situation. While rhetorically different, the results of the two methodologies can be complementary. Examples are drawn from two studies using different methodologies to study the same problem.

MEANING IN METHOD:

THE RHETORIC OF QUANTITATIVE AND QUALITATIVE RESEARCH[1]

With the growing acceptance of qualitative methods in education (Shulman, 1981), the debate has shifted to what their relationship to quantitative methods should be. At the extremes are two groups (Rossman & Wilson, 1985). The purists (e.g., Smith & Heshusius, 1986; Guba, 1978) believe that the two method-types are based on paradigms that are necessarily in conflict. In choosing a method, the researcher makes a long-term value commitment that is difficult to change. Pragmatists argue that there is no necessary logical connection between paradigm and method-types (Reichardt & Cook, 1979). Method-types are more collections of techniques that can be mixed and matched according to the specific problem.

An alternative view is suggested here, namely that the connection between method-type and paradigm is more aesthetic than logical. This view draws upon recent analyses of educational and social science research shaped by the study of the arts and literary criticism (Eisner, 1981; House, 1979; Gusfield, 1976). My suggestion is that qualitative and quantitative methods can be viewed as rhetorical devices. As such, each presents a different view of the phenomenon studied and uses different means to persuade the reader of the validity of the conclusions drawn. Yet, they are not antithetical. They present the reader with different kinds of information and can be used to triangulate to gain greater confidence in one's conclusions. This argument is advanced first in general terms and then illustrated by a comparison of two studies that use qualitative and quantitative methods to address the same issue.

Paradigms and Methods

The purists assert that qualitative and quantitative methods are based in paradigms that make different assumptions about the social world and about how science should be conducted as well as what constitutes legitimate problems, solutions, and criteria of "proof" (Kuhn, 1970). These differences have been treated extensively, and there is considerable agreement on what they are (see Guba, 1978). Four differences are most relevant for this analysis:

1. Assumptions about the world. Quantitative research is based on a positivist philosophy which assumes that there are social facts with an objective reality apart from the beliefs of individuals. Qualitative research is rooted in a phenomenological paradigm which holds that reality is socially constructed through individual or collective definitions of the situation (Taylor & Bogdan, 1984).

2. Purpose. Quantitative research seeks to explain the causes of changes in social facts, primarily through objective measurement and quantitative analysis. Qualitative research is more concerned with understanding (Verstehen) the social phenomenon from the actors' perspectives through participation in the life of those actors (Taylor & Bogdan, 1984).

3. Approach. The quantitative researcher typically employs experimental or correlational designs to reduce error, bias and other noise that keeps one from clearly perceiving social facts (Cronbach, 1975). The prototypical qualitative study is the ethnography which helps the reader understand the definitions of the situation of those studied (Goodenough, 1971).

4. Researcher role. The ideal quantitative researcher is detached to avoid bias. The qualitative researcher becomes "immersed" in the phenomenon of interest (Powdermaker, 1966).

The pragmatists respond, however, that the relationship between method and philosophy of science implied by the idea of paradigm is neither necessary nor logical. Reichardt and Cook (1979) present a number of examples that contradict expectations about differences between method-types that supposedly link them to paradigms. For instance, quantitative researchers use opinion polling to understand the perspectives of others and often immerse themselves

in the situation during the planning and pretesting phases of their studies. On the other hand, Sanday (1979) links ethnography--the prototypical qualitative method--to three different paradigms in anthropology. While the semiotic, represented by the work of Geertz and Goodenough, approximates the phenomenological paradigm that educational researchers associate with qualitative methods, it has also been used to further a kind of behaviorism that is quite close to the positivist paradigm.

If the connection between method-types and paradigms is not logically necessary, there remains a correlation. Quantitative studies are typically more positivistic than most qualitative research (Reichardt & Cook, 1979). To understand why that is, it is helpful to understand some of the rhetorical devices of research.

The Rhetoric of Research

Rhetoric is the art of speaking or writing effectively. It refers generally to how language is employed, but is has come to mean the insincere or even manipultive use of words. Technically, it includes the arts of persuasion and decoration or elaboration in literature (Frye, 1957). As such it is normally considered something to be avoided in research where the facts are supposed to "speak for themselves." Scientific writing is a stripped-down, cool style that avoids ornamentation, often stating conclusions as propositions or formulae. Forms of data presentation are supposed to be interchangable. That is, the use of tables as opposed to charts should be immaterial. There is also a standardization of form--the theory-methods-findings-conclusion format--that is intended to limit rhetorical excess (Eisner, 1981).

This absence of style turns out to actually be a rhetorical device in its own right (Frye, 1957). The use of propositions, for instance, is a means to empty language of emotion and convince the reader of the writer's disengagement from the analysis. If one of the threats to the validity of a conclusion comes from the writer's own biases, as is considered to be the case in science, then any technique that projects a lack of emotion has considerable persuasive power. Thus, language does serve a persuasive function in research.

Elaboration also has a role in research. Without reference to some larger field of meaning, scientific propositions make no sense. The words of every day language are rich in mutliple meanings. Like other symbols, their power comes from the combination of meanings in a specific setting (Cohen, 1979). Scientific language ostensibly strips this multiplicity of meaning from words in the interest of precision. This is the reason why common terms are given "technical meanings" for scientific purposes (Durkheim, 1938). However, there can be a sort of subterfuge in this process (Polanyi & Prosch, 1975). While on the surface, meaning is reduced, scientific terms must rely on their suppressed definitions to attract the reader's interest and concern. For instance, behaviorist psychologists study only a a limited range of forms of learning. However, their theories are valued because they make implicit reference to a wider range of situations that is suggested by the term "learning." Because scientific terms do have multiple meanings, the researcher must steer to reader's attention to specific ones. This is the work of demonstrating theoretical, policy, or practical relevance of the research that is accomplished in the introduction and the conclusion (Gusfield, 1976). It too requires rhetoric.

Recent attempts to understand the rhetoric of research have proceeded through the literary criticism of specific reports. Gusfield (1976) presents a masterful analysis of a quantitative study of drivers arrested for drinking. He shows how the study projects the image of the researcher as neutral, disengaged analyst (persuasion) at the same time that it presents a heavily value-laden interpretation of those who drink and drive and what to do about it (elaboration for meaning). House (1979) presents a similar analysis of an evaluation of an Upward Bound program.

Most analyses focus on the language of research and treat the data themselves as relatively neutral. Yet, the means of data collection, the results of those efforts, and the conventions about how to treat them can combine to create specific strategies for persuasion and project particular images of the research subject. These may vary systematically between quantitative and qualitative studies. To explore this possibility, I turn now to a comparison of two studies.

Two Studies

The issue studied is whether leadership makes any difference in organizational outcomes. This issue was viewed as decided for schools in the 1960s when the effect of family background was found to be so strong that school-specific variables seemed to pale in comparison (see Parelius & Parelius, 1978). Researchers doubted that principals could have any significant influence on student learning (Boocock, 1972). The effective schools research which points to the importance of strong principal leadership has reraised that issue (Edmonds, 1979).

Both studies described here examine the relative contributions of leadership and environment to organizational performance. The quantitative study addresses this issue by defining a specific set of variables and procedures for measuring them. The environmental variable is the family background of the students as indicated by the princpal's report of the percent of students who receive free lunches (SES). There are two leadership variables: centralization of influence in the principal as opposed to decentralization to the teacher (CNT) and the extent of princpal support for teaching (SPT). The outcome of interest is how much students learn (LRN). The initial theory assumes that the extent to which teachers work hard and try to teach all students in their class (TCH) mediates between the two leadership variables and student learning. The last four variables (CNT, SPT, TCH, and LRN) are all measured throught a survey of teachers in the school. The analysis is guided by a theoretical model which proposes that levels of LRN are influenced by TCH, SPT and CNT, and SES and that leadership is influenced by SES. Information comes from a national sample of 107 elementary and secondary schools (details of procedures are provided in Firestone & Wilson, 1986).

Two statistical analyses of the model are presented.[2] The first shows that SES has three times as much influence on LRN as the leadership variables. The second is a path analysis (Duncan, 1966) which verifies the existence of hypotehsized relationships between variables. It shows that SES has a strong direct effect on LRN; increasing control reduces learning. The effect of SPT is indirect. Increasing SPT increases TCH which in turn increase LRN. Together the two analyses suggest that leadership does influence student learning although not the extent that the environment does.

The qualitative study was part of a larger exploration of regional educational service agencies (RESAs), those agencies located midway between the state and local district. This project examined their contribution to research use in schools through training and dissemination activities. The study focused on pairs of Intermediate Units (IUs) in Pennsylvania and Education Improvement Centers (EICs) in New Jersey that were known to differ in the amount of training they offered. Data were collected using semi-structured interviews with agency directors and administrators, the training staff, and representatives of client districts. Interviews with state departments of education clarified the larger political context in which these agencies operated (see Firestone & Rossman, 1986 for procedures). All the information on each agency was then pulled together into a case study. By examining each case and comparing pairs of cases a typology of agency approaches to their task and explanations for why one approach was selected over another were developed. This use of a variety of materials and an inductive approach in a comparative case study design is typical of a fair amount of qualitative policy research (Herriott & Firestone, 1983).

Exploration of the pairs of cases showed that environmental constraints were similar. In Pennsylvania, for instance, state law which gave school boards control of IU budgets made those agencies responsive to district concerns.[3] However, the districts suffered from severe financial constraints and saw those agencies as competitors for funds. This concern was an important barrier to efforts to increase services by seeking grants. While environmental constraints were similar, the orientations of agency leaders

reflected the difference in approach. The director of the high-service entrepreneurial IU set the tone for his agency by aggressively looking for new services to offer and new sources of funds. When his board objected to this approach, he found ways to better justify new programs, but he did not give up the search. The leaders of the more laissez-faire IU were more defensive, spending relatively more time justifying their budget than seeking funds. The director of the high service agency challenged environmental constraints, but he did not simply "cause" the high-service approach. In fact, he appeared to be chosen because he reflected high-service orientations preferred by a key constituency on the board when the IU was founded. His contribution was important but did not provide a complete explanation.

The Studies Compared

An examination of the rhetorical elements of those studies indicates that they use quite different strategies to persuade the reader of the validity of the analysis and that they project different assumptions about organizational phenomena. An important by-product of these differences is that they provide complementary information to the readers.

Persuasion

The quantitative study persuades by deemphasizing individual judgment and stressing the use of established procedures. While the language of hypothesis testing is avoided, the impression is given that the whole study is a disciplined exploration of a preexisting conceptual framework. This is done in a variety of ways. At the most obvious level, almost as much space is given to describing the study's methods (four pages) as the results (six pages, including tables). The methods section describes the study's sample in

a paragraph. The rest of the section is devoted to a detailed discussion of measurement procedures. Another limitation to individual discretion is the use of a theoretical model to guide the analysis. This model is provided in a pictorial form in the introductory theory section, and criteria for determining when a hypothesized relationship is deemed to be supported are described in the results section section and justified with reference to previous methodological research. Thus, the text gives the strong impression that exploratory "data dredging" has been avoided.

In this case, the form hides part of the story because there was an exploratory element to the study. The study was triggered by the finding of negative associations between centralization and student outcomes when validity analyses were done for a manual describing the survey instrument. We viewed this finding as contradictory to the effective schools research which argues that strong leadership promotes achievement. We reasoned further that if this finding could be replicated when controlling for student background, it would be an important contribution. Reporting this personal aspect would undercut the impression the paper now gives of being a detached "test" of a theory.

Less attention is given to describing procedures and how individual judgment is disciplined in the qualitative study. The study is presented as frankly exploratory. The strategy is one of comparing pairs of agencies known to be different in order to discover what might explain those differences. That search is not described as strongly controlled by preexisting theory. There is no preliminary model. Instead, reference to past research is incorporated into the presentation of findings. The methods section is only

two pages long while the results take over twenty. About half the methods discussion describes the agencies selected and demonstrates that they did in fact differ in services provided since the reader must be convinced of that fact to be persuaded of the value of what follows.

While analysis procedures are not described, some controls stemming from the criteria of good qualitative analysis were used. One of these is the admonition to search for competing explanation and negative evidence (Campbell, 1979). This served well in the analysis of leader contributions. The first analysis showed a remarkable similarity between the values professed by the top leaders and the organizations' approaches. This could have led to an overestimate of leaders' influence on those approaches, especially where the entrepreneurial IU maintained its approach in spite of external opposition. However, further exploration indicated that the director there had been selected because his values fit the interests of a strong constituency. Openness to this possibility helped to avoid an overestimate of leader influence.

That search is not described in the text, in large measure because it is less relevant for persuading the reader. In fact two very different strategies are used: rich depiction and strategic comparison. The first is the hallmark of most qualitative research; the second is required by the effort to understand differences between pairs of agencies. Taken together, these approaches pile up a series of significant, concrete details to give a convincing depiction of each agency and of the differences between them. For instance, several different kinds of data were used to show that Farmland IU was more entrepreneurial than Rural-Industrial. These included telling quotes from interviews, a description of agency staffing patterns, and excerpts from

agency history illustrating the entrepreneurial orientation in action. The details are convincing because they create a gestalt that makes sense to the reader. This is a process Polanyi and Prosch (1975) describe as building up a focal impression out of a series of subsidiary details. It depends upon the active effort of the reader and the reader's willingness to check these details against personal experience.

In sum, the persuasive strategies of the two kinds of research are very different. The quantitative study must convince the reader that procedures have been followed faithfully because very little concrete description of what anyone does is provided. The qualitative study provides the reader with a depiction in enough detail to show that the author's conclusion "makes sense." For that reason, discussion of procedure is not emphasized. Too much attention to procedure can get in the way of the narrative line which attempts to build a concrete impression of the phenomenon studies.

Assumptions

In addition to using different persuasive strategies, the two studies make different assumptions about the world. This distinction is highlighted when one focuses on how each handles causation.[4] It can be described through three dichotomies: variables vs. actions, hydraulic determinism vs. limits and opportunities, and randomness and error vs. choice.

The quantitative study portrays a world of variables and static states. The text refers to levels of centralization or principal support, but one can only infer from the questionnaire items what a principal does to centralize or how (s)he provides support. By contrast the qualitative study describes people acting in events. A director tells how he uses hiring interviews to encourage staff to actively sell services or an informant tells about the

political battles that led to the legislation governing IUs. Even the "state" of entrepreneurialism is portrayed through a dispute between an agency's board and its top leadership over how actively outside funding should be pursued.

The quantitative study uses a hydraulic image of determinism as if pressure from one variable changes another. Regression coefficients indicate how much one might expect the dependent variable to increase for a given change in an independent variable. The effect of the tables is reinforced by language about the "per cent of variance" in one variable that is attributable to others. The implicit imagery is of a system of interconnected variables where pressure from one forces change in another. The abstraction process that directs attention from the total situation in a school to a set of variables implies an almost physical connection between those variables. The qualitative study presents a more complex view of a world in which there are limits and opportunities that individuals must take into account and use. These include the IUs' required budget approval procedure and external funding competitions. These limits and opportunities shape action, but do not determine it.

Finally, the two studies suggest different alternatives to causality. The quantitative study emphasizes randomness and error. The study design, especially the sampling procedure and instrumentation, are intended to reduce the amount of error in the study. They are described to help the reader assess how well that task was accomplished. Once as much error is eliminated as possible, two alternatives remain--randomness and the causal forces of the measured variables--and statistical tests are used to choose between them. The alternative to causality in the qualitative study is choice. Constraints and opportunities are real but ambiguous. Leaders decide how to respond to

them, for instance, when they encourage or discourage fund seeking. If their choice violates those constraints, there will be a response that requires a change of strategy (as in Farmland's case) or even organizational demise (as in the New Jersey situation not discussed).

These different assumptions do not stem from the phenomenon studied. They come in large measure from the way the researchers collect and process their information. These steps shape the nature of the final text which then reinforces those assumptions stylistically.

Complementarity

The differences presented above give qualitative and quantitative studies different descriptive strengths. The quantitative study assesses the magnitude of relationships more precisely. One can say rather clearly that 61 percent of the variance in LRN is explained. The qualitative study concludes with more ambiguous statements like "strong leadership is necessary, but not sufficient for excellence." The other advantage of the quantitative study is that it shows a pattern that extends across a large number of situations. In fact, the conclusion rests on showing the joint association of variables in many settings. The use of many sites increases confidence in the generalizability of results although technically generalizability depends upon the randomness and representativeness of sample selected. The trade-off of course is in abstraction. One's confidence in the conclusions depends on one's comfort with the way variables are measured and relate to the issues of interest, the quality of the sample, and the general design of the study.

The classical strengths of qualitative methods are concrete depiction of detail, portrayal of process in an active mode, and attention to the perspectives of those studied (Patton, 1980). These strengths help to overcome the

abstraction inherent in quantitative studies. These advantages appear in this qualitative study through quotations and descriptions that illustrate the perspectives of staff, leaders, and outside clients. However, the description is thinner than in more ethnographic studies. On the other hand, the use of four cases allows for some comparison in order to identify patterns across situations. It also gives greater confidence that conclusions do not depend upon the idiosyncracies of the specific situation so it is something of a mixed case.

Used separately, qualitative and quantitative studies provide different kinds of information. When focused on the same issue, qualitative and quantitative studies can triangulate--that is, use different methods to assess the robustness or stability of findings (Jick, 1979). In this case the two studies generally corroborate each other. The quantitative analysis shows that SES has the strongest impact on LRN, but the leadership variables also have an undeniable effect. The qualitative study shows a strong congruence between leader values and organizational approach. Leaders can even challenge the environment. Yet, it is also clear that leaders are partly chosen for their values and have their greatest effect at certain critical times so their influence is limited. In the main the two studies corroborate each other.

Conclusion

A rhetorical analysis of these two studies of the same topic suggests that there is an aesthetic connection between method-types and paradigms. The methods used in each express the values of the related paradigm about what the world is like and how one must show the truth of an argument. The methods of quantitative research, indirect perception controlled by study design and

instrumentation, voice the concerns of the positivistic paradigm to identify objective social facts and eliminate error. Quantitative procedures also give the impression of detachment and lack of bias. The whole strategy of abstraction through measurement is intended to apprehend "the facts" without distortion by irrelevant detail. Persuasion depends upon showing the adequacy of one's methods for identifying the single, undistorted truth.

Qualitative studies devote less space to procedure and more to description because less emphasis is placed on identifying a single truth. Through presentation of numerous specifics, the qualitative account shows how the concrete facts of the situation fit the explanation proposed. The persuasive strategy has two parts. First, the reader must be convinced that the researcher has become immersed enough in the setting to know it well. Second, sufficient concrete detail must be provided to permit comparison with the reader's own experience to see if the findings "make sense." This strategy fits with a view which holds that bias can be minimized but not eliminated and that in any case there are multiple realities that are socially constructed.

Quantitative studies also project very different assumptions about the world from qualitative studies. The measurement strategies employed portray an image of a world of static variables, social facts that are linked through hydraulic causal connections. Human action only plays a role to the extent that it can be "measured." Qualitative studies are much more likely to describe that action and leave room for interpretation and choice. "Causation" is not so much a hydraulic or mechanical process as the constraints and opportunities that shape choice.

These rhetorical differences in method do not negate the view that there are instrumental reasons for choosing particular methods in specific situations (Patton, 1980). Each method-type does provide different kinds of information. Their strengths and weaknesses are complementary. Quantitative studies assess relationships precisely without describing how conclusions apply in any particular context. Qualitative studies show the connection between conclusion and situation very clearly and also gives a strong sense of process but they lack the precision of quantitative studies. Thus, each can make a contribution to a reader who is concerned about the subject of study without being firmly committed to either paradigm.

Still, choosing methods is not just a matter of coming at a single truth from different directions. While there are a number of reasons for selecting a methodological approach, one's decision often expresses values about what the world is like, how one ought to understand it, and what the most important threats to that understanding are. The method selected encourages one to deal with research issues in a particular way and to advance certain kinds of arguments for the credibility of one's conclusions. These nonlogical methodological tendencies fit with individual stylistic predilictions as well as the philosophical underpinnings of the positivistic and phenomenological paradigms of research.

ENDNOTES

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2. Examples are taken from the analysis of elementary schools. A parallel analysis of secondary schools yields substantially similar results.
3. Examples are taken primarily from the comparison of IUs. The analysis of the EICs in New Jersey yielded very different concrete events, but the conclusions of the analysis were very similar. Agency names are pseudonyms.
4. Some indication that the differences between methods are not as sharp as the purists claim comes from the observation that qualitative methods deal with causality at all.

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